The Commercial Space Launch Industry

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Senator Frist, members of the committee. Good morning.

I am Gale Schluter, Vice President & General Manager of the Boeing Expendable Launch Systems Segment. We provide launch services to U. S. Government and commercial enterprises. We are best known for the Delta launch vehicles which have launched the majority of U. S. civil satellites... flying over 250 Deltas since 1960. In the late 1980's we developed Delta II as launcher for the Air Force's Global Positioning Satellites (GPS) constellation. Delta II is a major player in the launch of commercial communications satellites, including those for Iridium and Globalstar. In addition, Delta continues to serve as a workhorse for NASA science missions, including the recent Mars Pathfinder.

It is an honor for me to be before you today to testify on the subject of the state of the commercial space launch industry and the barriers that it currently faces.

History of the Delta Space Launch Vehicle

Most of today's launch vehicles can be traced to rockets developed in the 1950's for defense purposes. In the case of Delta, it was developed by NASA in the late 50's from the United States Air Force Thor Intermediate Range Ballistic Missile (IRBM). The initial Delta, launched in 1960, boosted less than 100 pounds to orbit.

Over the years Delta has averaged a major upgrade every 2-3 years. These upgrades include six solid rocket motor developments, eight liquid engine and stage developments, and twelve payload fairing developments. Today's Delta II carries over 4,000 lbs to Geosynchronous Transfer Orbit (GTO).

Delta III, soon to be operational, has a payload capability twice that of Delta II (8,400 lbs). Unlike Delta II, the Delta III was developed completely by our company's own investment – there was no federal funding involved in the development.

In 2001, Boeing will introduce the Delta IV family of launch vehicles that will provide a cost effective launch service for both United States Government (USG) and commercial customers. The capability of the Delta IV family ranges from 4,000 lbs to 29,000 lbs to Geosynchronous Transfer Orbit. Delta IV has been developed as part of the Air Force Evolved Expendable Launch Vehicle (EELV) program and financed by both government and significant private investment.

In short, Boeing has been in the launch business a long time. With that said, the business is changing dramatically.

Current Environment

The demand for launches has seen a immense growth from the early 1990's. In 1989, Boeing launched its first commercial satellite. In 1994 the space launch market was approximately $3B per year, evenly split between USG and commercial launches. In 2002 we expect the market to reach $6B per year with commercial launches outnumbering USG launches by 3 to 1.

Today's launch industry market is fueled by the burgeoning global demand for commercial telecommunication services reflective of "the information age." The satellite industry has moved from building limited numbers of relatively unique platforms to the deployment of global satellite constellations.

As with any growth market, competition in the launch market has become intense and global. Our commercial customers evaluate providers of launch services based upon the performance and reliability of the launch vehicle, the availability of a launch opportunity, and the cost of the launch service. While at one time we were focused almost exclusively on performance, the marketplace of today demands intense focus on providing performance and reducing cost. Further we are being asked to provide launch services not simply launch vehicles.

Our customers have business plans that demand revenue generation as soon as possible after they invest in the space infrastructure. This means that they want to launch their satellites as rapidly as possible without long delays. This has forced us to reduce the cycle times associated with launch pad activity and range operations.

Both the US government and US industry are responding to the changing market dynamics. As a result of the Air Force's EELV program and its unique approach to leverage commercial practices, both Boeing and Lockheed Martin will introduce new families of vehicles in 2001 designed to meet market demand and regain market share. In addition, US led partnerships such as Sea Launch will come to market. But so too will Ariane 5 and launchers from Russia, China and Japan as the competitive race continues.

While I am confident the US launch industry can be competitive for the next ten years as it relates to expendable launch systems, we cannot be satisfied to merely compete for the status quo. To truly realize the potential of space we

must reduce the cost of going to orbit by orders of magnitude by moving to fully reusable launch vehicles capable of routine, airplane like operations.

Impediments to Growth of the US Industry

The current US commercial space launch industry faces the following governmental barriers:

I. Allocation of Risks

Erosion of Indemnification Protection

1. NASA has taken the position it can not provide Public Law 85-804 indemnification to Industry for some of its launches since there may be no national defense nexus.

2. Commercial Space Launch Act (CSLA) indemnification provisions for US Commercial launchers expire in December 1999.

3. FAA rulemaking aimed at narrowing the definition of launch activity covered by a license reduces Industry's indemnification protection.

4. Commercial Space Operations Support Agreement (CSOSA) imposes liability on Industry for Government negligence and gross negligence related to commercial space activity on federal ranges not controlled by a FAA license.

II. Commercial Space Launch Act (CSLA)

CSLA Does Not Reflect Today's Commercial Environment

1. The current CSLA is no longer adequate in scope or implementing language to effectively promote the US Commercial Space Launch Industry (e.g., definition of excess launch property, allocation of direct and indirect cost). The CSLA was written during a time when government launches dominated range activities. It now requires modification to reflect the current environment where commercial launches dominate range operations. This business mix places the government in a position of needing to provide range support to an

important commercial industry without providing clear guidelines for the allocation of cost between government and industry.

2. The CSLA licensing process should be made more clearly applicable to the Government's procurement of launch services encouraging a commercial acquisition process.

III. Infrastructure Improvements

1. While both industry and the USG are investing in more modern launch vehicles, government owned launch infrastructure is not keeping pace. This lack of investment is due to resource limitations and prioritization. However, the result is that older facilities and range capabilities will prevent the USG and US launch industry from fully being capable of supporting increased launch rates and reduced launch cycle times required by the commercial satellite industry.

Solutions Boeing is Considering

As mentioned above Boeing is responding to competitive pressures by developing the Delta IV family of vehicles. This effort done in partnership with the USAF will lead to reduced costs for both the USG and the commercial launch customer.

Delta IV features a new US developed propulsion system designed specifically for recurring low cost; a new factory aimed at the efficient production of common booster cores; and a streamlined launch vehicle integration facility and launch pad operation aimed at reducing cycle times at the launch site.

Delta IVs will be launched from government owned launch sites. To ensure the investment in vehicle technology is not lost on antiquated launch facilities, the USG must work with industry to maintain and upgrade the launch range infrastructure. These upgrades are required if the US launch industry is to be successful in launching an increased share of the commercial launch market. The USG will benefit via reduced launch costs for its payloads.

While addressing the statutory and facility related issues of the current ELV industry is important, we at Boeing see reusable launch vehicles as the long-term solution to space access and the true means to realize the potential of space-enabled telecommunication solutions.

NASA and its industry partners have taken the lead via the X-33, X-34 and

Future X programs in demonstrating cutting edge technologies. I want to commend your committee for taking leadership in legislating the indemnification and cross-waivers necessary for the testing of the X-33 and X-34 launch vehicles. As these programs move beyond their government funded technology demonstration phases, it will be up to industry to apply the technologies to commercially viable systems designed to address market demands.

Summary

It is clear that a robust US Space Launch Industry supports both the economic security and national security of this nation. For the reasons stated above, we are enthusiastic about the direction the commercial space launch market is taking, while at the same time we are encountering increasing competition with substantial uncertainties which will affect market growth in the coming years. As such, it is more important than ever to have stable and predictable space policy, specifically in the areas related to support of the commercial launch service industry, allocation of risk, and continued access to government-supported launch sites.

Thank you.